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ABSTRACT

A film course especially designed for technical communication students can illustrate basic film concepts and techniques while showing how film effectively communicates ideas in an industrial and scientific communication system. After a basic introduction to film terms, the study of actual scientific and industrial films demonstrates the following film concepts: composition and movement; the realism and credibility that sound adds to the message; the use of creative editing to simulate action too dangerous or costly for the camera; and the manipulation of time and space, particularly through the use of animation, to explain concepts or demonstrate actions that cannot be filmed. A film course can also highlight other important elements involved in using films for science and industry, such as the importance of audience analysis to determine the particular concerns and background of the target audience, persuasion and motivational factors that the use of film offers, and the typical film problems of subject matter, lighting, and non-actors. Science films present special problems for study in that they often simply record technical material, have no sound track, and allow little, if any, editing. (MAI)

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USING SCIENTIFIC AND INDUSTRIAL FILMS IN TEACHING TECHNICAL COMMUNICATION

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Scientific and industrial films today are technically well executed messages aimed at very specific audiences. These film-makers have the challenge of presenting complex concepts and information in a way that is both clear and visually interesting. Most of these producers would agree with Harold Daffer of Honeywell, when he observes:

> In producing industrial films we must make every effort to match the dramatic impact and quality of the finest television and entertainment films available today. Today's audiences demand sophisticated, quality motion pictures. To offer them less invites loss of attention (1).

Because of their quality and content, examples of these films can be a valuable addition to a curriculum like Technical Communication, which stresses applied communication.

The Technical Communicator may be seen as a communication facilitator, applying communication skills in scientific and/or technical fields (2). Technical Communication programs are developing on many campuses in response to the demand from government and industry. A 1975 survey indicated that 19 schools offered undergraduate degrees in Technical Communication, and 6 offered advanced degree programs (3). The Technical Communication program at the University of Minnesota is typical of this growth. Begun in 1971, it now has 56 majors and is attracting more every year--both new students and

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transfer students from English and Journalism who have an interest in science. The average curriculum in the schools surveyed requires 25%-40% of the course work in science and technology, 30% in communications and the remaining hours in general requirements (3). While the communications skills traditionally emphasized have been technical writing and graphics, students need to be trained in the uses of film and video as well. Audio-Visual Communications magazine listed over 430 in-house audio-visual corporate communication centers in 1978 (4), which suggests the popularity of visual communication in the private sector today. Kodak reports that sales of 16mm film to industrial and medical markets continue to rise in spite of the increasing use of video and 35mm slides. Clearly, to be well trained in a competitive job market, students should have some background in visual communication.

Although science and industry have evidenced considerable interest in the use of film and video as communication media, only 6 of the 19 Technical Communication programs surveyed listed film, video or visual communication in their curriculum, and these courses are generally offered in other departments (3). While most schools offer an introductory film appreciation course, a film course especially designed for Technical Communication students can accomplish certain objectives that the general course cannot. It can illustrate basic film concepts and techniques while showing how film functions in an industrial and scientific communication system.

Most important in any beginning film course is the need to teach the students how film works to communicate ideas. An introductory textbook and a film which illustrates basic film terms can lay the ground work. After that, a selection of scientific and industrial films can illustrate essential

film concepts such as composition, movement, sound, editing and manipulation of time and space. In the case of sound, most industrial films are voice-over with a music background, but it is easy to notice how on-location sound effects can add realism and credibility to the message. Although music is usually from music libraries, some films have original scores like Honeywell's Page Printer System, where the electronic music enhances the computer system being demonstrated because it sounds like a melodic computer. Creative editing is frequently used in the safety films the Mining Education and Safety Administration (MESA) produces to simulate accidents which would be too costly or dangerous to perform for the camera. Although usually working with small crews, industrial filmmakers demonstrate that they understand how to use the medium to get their messages across.

Scientific and technical films offer particularly interesting examples of animation to explain concepts or to demonstrate actions that cannot be filmed. Parke, Davis produced Neurological Examination for physicians and medical students. While tapping the knee or checking the eye produces observable responses, the reaction in the nervous system causing these responses can be shown only by animation. Similarly, while MESA could photograph longwall mining machinery in action, it was not possible to see exactly what the machine was doing. A short animated sequence demonstrated clearly how the complex machinery functioned in the mining operation. Unlike a theatrical filmmaker who can select an essentially filmic subject, the industrial filmmaker is frequently faced with a mesage in which vital parts are unfilmable. Creative use of animation is often the solution.

In addition to basic film techniques and their application, these films can illustrate important elements in scientific and corporate communications: typical film problems, the importance of audience analysis

and the uses of film. In understanding the difficulties involved, a Technical Communication student gains a respect for the work of these filmmakers and an understanding of how to avoid some of the pitfalls.

Perhaps the main difficulty that industrial filmmakers face is that of subject matter. In corporate/industrial situations, the ideas for films are usually generated by non-film people in various divisions and turned over to the in-house unit for production. Predictably, some of these ideas or presentations are not filmic. The producer may be able to persuade his client to alter his concept to fit the medium or he may not, and the resulting film may be filled with talking heads or irrelevant shots of buildings while the voice track carries the entire message. Bill Steinbicker of Honeywell encourages producers to speak out against these unsuitable film projects, reminding them:

> But simple straightforward films are the ones that work best, and it is up to us, the producers of these films, to insist on and fight for this concept--even if it makes our customers mad (5).

But the producers don't always win the argument and showing a few of these films can make students aware of one of the problems that Technical Communicators may face in the business world, and, at the same time, show them the limitations of film. While it is the most expensive and exciting communication medium, it does not convey all kinds of information equally well. Depending on the message and its purpose, a brochure or written report may be more appropriate, as any student will perceive after 3 minutes of watching a talking head read pages of figures and statistics.

Even with a workable script, the industrial filmmaker may have assorted technical problems. Lighting, always a problem in non-studio interiors, can go beyond the usual difficulties of available outlets and adequate power.

Many machines have photo-electric controls; when the movie lights go on, the machines turn themselves off. Certain photo-sensitive products must be manufactured under yellow light, and shooting close-ups of fast-moving machinery can create more challenges. Micro-cinematography is another complex field. Parke, Davis' The Effect of Viruses on a Cell Line of Human Origin shows live cells, filmed over a period of days, reacting to different viruses. Films about computers or the need to include product tests preserved on video tape require filming a video screen. Even with a high quality monitor and sync set-up, difficulties can still arise. Finally there is the non-actor. Although company personnel are the most knowledgeable about a product or test, they may appear stiff and unconvincing before the camera. High ranking executives who have no time for rehearsals and retakes pose an extremely delicate situation as they expect the filmmaker to make them look impressive in a single take. While this is only a partial list, the successful or unsuccessful resolution of these problems can be very instructional to students.

Central to success in applied communication is audience analysis. Since these films often present technical material, the particular concerns and background of the audience must be guaged very accurately. Marketing films must present highly technical material to customers who may have a business rather than an engineering background. Bill Steinbicker describes the problem:

> It can be like walking a tightrope to find the right balance of polish, flair and straightforward information presentation that will enhance the film's marketing appeal without insulting or alienating the audience (5).

To make the film too simple will lose credibility; too much technical material

may bore the viewer, and loss of attention may mean the loss of a sale.

Like marketing films, safety films must motivate the audience to act. Here the problem is not one of introducing new material as much as it is presenting hazards that the viewers already know exist (6). Convincing workers to change convient habits to the suggested safety precautions is a real challenge, and students can observe both persuasion techniques and audience analysis at work. This helps them to see applied uses of concepts that they have studied.

Finally, a cross section to these films can show how they are used in the corporate communication spectrum and within the scientific community. Films directed at audiences outside the corporation are used for public relations, information, marketing, proposals, progress reports and training customers on the use or repair of a product. Internal films may be for reports, internal marketing, safety, sales meetings, and internal image or morale presentations. Students can see how film may be combined with other media for a particular presentation. For instance, Chrysler's XM1 Rollout (4 min.) was part of a proposal. The film concisely but dramatically shows the prototype of the XM1 tank in operation, illustrating its important features. The accompanying written proposal provided the complete documentation and figures. The major marketing points were made in the swiftly moving, enjoyable film; the supporting evidence was in the written material.

While science films may be made for the general public or for students, an important use is for professional communication within the scientific community. Sometimes these films simply record technical material. They may have no sound track and little, if any, editing. An example of this is film being used to preserve computer graphics and to make them available to

colleagues who cannot visit the computer site. The film Space Shuttle Simulation Graphics was produced by Richard Weinberg as part of a graduate seminar at the University of Minnesota to show the graphics that he had developed for the space shuttle training program at the Johnson Space Center in Houston. Since there are only three of these particular computers in use in the world, film was the most viable method for presenting these graphics to an audience outside of the Space Center.

It can be seen, then, that industrial and scientific films can demonstrate a number of basic communication and cinematic principles being applied to technical material. They show the effectiveness of film as part of the corporate communications structure and that excellence can be achieved by small in-house units working on modest budgets. Finally, since most of these films must be borrowed from the companies who make them, a link between the university and industry is established. Industrial filmmakers have been extremely cooperative in lending films, giving production information and talking to students about their work. Since a major emphasis of our Technical Communication program is a study of applied communication, these contacts with the people who are making and using films as communication channels are a valuable addition to our cirriculum.

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